

Due: Wednesday, October 23

HMC Math 142 Midterm Exam Fall 2017

Prof. Gu

October 4, 2017

Note: Official Exam Date is October 18. There is no class on that day and you are expected to work on this exam, but you are encouraged to start this project early.

You must write a paper consisting of both a theoretical part and an applied part. The lengths of these two sections doesn't matter as long as they are both present, and that the total page length of the paper is at least 6-8 pages. An acceptable length of the paper will be determined by your previous homework choice (please indicate below which one you had chosen). If you had chosen choice 1 you are required 8 pages, choice 2 required 6 pages, choice 3 required 7 pages. The paper needs to utilize concepts in differential geometry and manifold theory. You are encouraged to look at published research articles, textbooks, or other online material/publications, as long as differential geometry remains the central focus. You are more than welcome to present your own original research if you like as well.

Please circle one of the following for the homework 6 you had chosen

1. Choose a project of your preference. Write 2 pages of your work of the project that could be background sections, introduction, development or implementation of an algorithm or a model, some theorems, etc. Identify at least one or a couple research articles.
2. Choose to work on homework problems. Work on part B, and choose 3 problems that interest you from part C to write up. Keys for part C are attached in resources.
3. Choose half and half. Choose two problems from choice 2 (you can either choose 2 problems from part C or you can choose 1 problem on part C and works out the problem in part B) and one page of work on choice 1